IN THE CLAIMS:

Please add claims 44-64 as provided below.

44. (New) A non-mass analyzed ion implantation system comprising:

a plasma chamber including a plasma source operable to generate source gas ions therein;

an extraction assembly operable to extract ions from the plasma chamber;

a process chamber for receiving the ions extracted from the extraction assembly; and

a workpiece support assembly situated in said process chamber, and operable to secure a workpiece in an orientation for being implanted by the ions extracted.

45. (New) The non-mass analyzed ion implantation system of claim 44, wherein the extraction assembly is associated with a top portion of the plasma chamber, and is operable to extract ions from the top portion thereof, and

wherein the workpiece support assembly is operable to secure the workpiece having an implantation surface orientated facing downward toward the extraction assembly for implantation thereof.

46. (New) The ion shower of claim 45, wherein the plasma chamber further comprises a bottom portion and side portions, and wherein the plasma source comprises an inductively coupled plasma source.

47. (New) The ion shower of claim 45, wherein the plasma chamber further comprises a bottom portion and side portions, and wherein the side portions comprise a plurality of multi-cusp magnet devices operable to produce multi-cusp magnetic fields thereat to facilitate an azimuthal uniformity of plasma within the plasma chamber.

48. (New) The ion shower of claim 47, wherein the multi-cusp magnet devices comprise electromagnets operable to provide a variation in multi-cusp magnetic field strength at differing positions along the side portions.

49. (New) The ion shower of claim 48, wherein the electromagnets are independently controllable, thereby facilitating a tuning of the multi-cusp magnetic fields.

50. (New) The ion shower of claim 45, wherein when the plasma source is deactivated any contaminants suspended within the plasma fall toward a bottom portion of the chamber away from the extraction assembly due to an influence of gravity, thereby preventing such contaminants from reaching the workpiece.

51. (New) The ion shower of claim 45, wherein the plasma source further comprises two grounding rods operable to collect excess electrons within the plasma chamber during extraction of ions from the top portion thereof.

52. (New) The ion shower of claim 51, wherein the two grounding rods are doped silicon, and wherein when one of the grounding rods is grounded, the other grounding rod is negatively biased with respect to plasma within the plasma chamber, thereby causing the other grounding rod to be sputtered by the plasma and substantially preventing the other grounding rod from becoming an insulator due to excessive oxidation thereof.

53. (New) The ion shower of claim 52, wherein the two grounding rods are coupled to a square-wave voltage associated with the plasma source, and wherein a phase difference of the square-wave voltages between the two grounding rods is approximately 180 degrees.

54. (New) The ion shower of claim 45, wherein the extraction assembly comprises a plurality of extraction electrodes vertically oriented with respect to one another and operable to extract the ions vertically from the top portion of the plasma chamber.

55. (New) The ion shower of claim 54, wherein a first extraction electrode of the plurality of extraction electrodes is closest to the plasma within the chamber and comprises a plurality of extraction apertures extending therethrough.

56. (New) The ion shower of claim 55, wherein the plurality of extraction apertures extending through the first extraction electrode collectively have an area associated therewith and wherein a ratio of the area to the total area exposed to plasma defines a transparency, and wherein the transparency is less than 50%.

57. (New) The ion shower of claim 56, wherein the first extraction electrode further comprises cooling passages therein, and wherein a cooling fluid flowing therethrough is operable to cool the first extraction electrode during extraction of ions from the chamber.

58. (New) The ion shower of claim 55, wherein the extraction apertures of the first extraction electrode each have an area, and wherein extraction apertures of the other extraction electrodes are substantially aligned with the first extraction electrode extraction apertures, respectively.

59. (New) The ion shower of claim 58, wherein the extraction apertures of the other extraction electrodes have respective areas that are greater than the area of the first extraction electrode apertures.

60. (New) The ion shower of claim 55, wherein at least one of the other extraction electrodes further comprise interstitial pumping apertures, wherein the interstitial pumping apertures reduce a pressure near the extraction assembly external to the chamber.

61. (New) The ion shower of claim 60, wherein the interstitial pumping apertures have an area greater than an area of the extraction apertures of the first extraction electrode.

62. (New) The ion shower of claim 54, wherein a spatial density of the extraction electrodes about the first extraction electrode is non-uniform.

63. (New) The ion shower of claim 62, wherein the spatial density of the extraction apertures is greater along an outer periphery of the first extraction electrode than a center portion thereof, and wherein the non-uniform spatial density of the extraction apertures serve to compensate for any plasma non-uniformity within the chamber, thereby resulting in greater beam uniformity at the workpiece.

64. (New) The ion shower of claim 45, further comprising an evaporative cooling unit in heat transfer communication with a top portion of the workpiece support assembly, and operable to cool the workpiece *via* evaporative cooling during an implantation thereof.